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## **BUBBLE BLOWING**

**NEW!!! Super bubble solution!** Mrs. April Koebert, a very dear friend from high school, sent me some pencils with the top half converted into a small holder for a bubble wand and bubble solution. The pencils are blue with a blue heart as the end cap. The only writing on the pencils, which came from a Paper Warehouse store in Colorado, is "Made in Taiwan." This is the strongest, longest-lasting bubble solution I have ever found! The bubbles last up to half an hour. Many times they dry and still hold their shape. They also have excellent color. I readily recommend these pencils to anyone needing long-lasting bubbles. There are, however, two problems: when the bubbles pop they leave a residue and the vials only hold enough solution for a few blows. Still, they are outstanding.

**NEWER!!!** Wal-Mart started selling much larger bubble sets containing the super-bubble solution mentioned above. For \$2.00 you get 1/4 cup of solution in a handy clip-on holder that contains a small bubble wand. This set is called "Catch-A-Bubble" because the bubbles are so durable that after drying in the air for ten seconds they are strong enough to be gently gathered and stacked. They last for hours and often don't pop even when they touch dry dirt or carpeting, sure killers of regular bubbles.

**NEW BUBBLE MACHINE TESTED!** Party America stores sell the Lite F/X bubble Machine (model 1761) for \$40. This machine pumps out more bubbles than all of the other machines mentioned further down on this page combined! It's an attractive, compact, easy-to-use device that runs on either 8, AA batteries or a power cord. It'll run for ten minutes before foaming, a problem in almost all machines, starts to become a problem but even then it delivers a heavy stream of bubbles. I'm throwing out all of my other machines and keeping this one.

**NEW!** I tried Kookamunga Catnip Bubbles. They didn't seem to interest either of my cats and didn't last very long compared to premium bubble solutions.

I took the output from a smoke generator, mixed it with helium from a party-balloon kit and ran the combination into an automatic bubble maker. The result was smoke-filled bubbles that floated instead of sank. They looked like giant floating pearls.



Walmart is selling a battery-powered bubble gun for \$5.00. Although one of the three I bought didn't work, the other two produce a steady stream of bubbles. These guns can be temperamental but when they work, they really put out a lot of bubbles. They are also much neater than any of the other machines I've tried. They don't foam up and don't drool as much bubble solution. The optimized bubble mixture I discuss further down the page works much better than the solution provided with the guns.



Here's a picture of some of the solutions and machines I've tested.



From left to right: Theatre Effects bubble juice (a bomb), Bubble-Pro bubble juice (okay), Visual Effects Inc. bubble juice (outstanding!), Bubble Pro machine (poor wand design), Visual Effects Mini-Bubbler (good), Unique bubble solution (okay), Imperial bubbles (so-so). Unfortunately, both bubble machines are flat black and impossible to get a good photo of.

I enjoy setting up a bubble machine in the back yard and letting the bubbles drift all over the neighborhood. They never fail to make children and adults alike smile. Here are the results of a few tests on bubble mixtures I've tried, comments on bubble machines, and links to other, more complete, bubble sites. All of my comments pertain to lightweight bubbles intended to float on the wind. Heavy, durable bubbles for fixed displays are not addressed here.

I've coined two terms to help compare different bubble solutions: the **dip** and the **blowout**. A **dip** refers to dipping a bubble wand into a solution and seeing how many bubbles it generates on average. For the tests listed below, many dips of each solution were used to build an average of how many bubbles the average dip provides. A **blowout** is when a bubble machine's dipper moves in front of its fan and the bubble solution is blown away without generating and bubbles. Weak solutions, like Mr. Bubble, when used in the bubble machine I used to test the solutions, had seventy percent blowouts. This is a case where the lower the percent blowout, the better the bubble solution. A zero percent blowout means that the solution produced bubble continuously with no breaks in production.

Please note that bubble lifetime is strongly determined by environmental conditions. Bubbles are notoriously short-lived on hot, dry, dusty days and can last for minutes on cool, shady, humid days. All of the tests comparing solutions were made at the same time and under the same conditions.

### **Commercial bubble solutions:**

These are the small bottles found in grocery and toy stores.

Mr. Bubble, the most common brand, was the worst of the commercially prepared solutions tried. The color is weak and the bubbles last less than thirty seconds. I got an average of ten bubbles per dip.

Mattel, sold as Hot Wheels Bubbles and other names, it's preformed the same as Mr. Bubble.

Imperial bubble solution bubbles seem to have a little more color and last about ten seconds longer. I got an average of 15 bubbles per dip.

Unique bubbles where the best of the grocery/toy-store grade solutions tested. It generated the most bubbles per dip (up to 18) and they outlasted the other three solutions. These worked so well I tested them against the professional-grade solutions.

Pustifix, from Germany, has very strong colors and the bubbles last up to one minute. The problem is that this solution is very hard to find. Your best bet is a high-end toy store. Actually, Pustifix should be listed with the professional grade solutions but it's been placed here because I've only found small bottles of it in toy stores and it's very expensive.

### **Professional grade solutions:**

These are usually sold in quart or gallon bottles and are supposed to be superior to commercial grade solutions. All of the following tests used a V-9903 Mini-Bubbler bubble machine by Visual Effect Inc. As a baseline for comparison, Imperial solution had a fifty percent blowout rate: half of all the wands that passed in from of the air source failed to produce any bubbles. I would have liked to

test Pustifix in the machine but the only bottle I had was an old one and there wasn't enough of the solution to work in the machine.

Theatre Effects This solution preformed so poorly I have to think there was something wrong with the bottle I purchased. The blowout rate was ninety-five percent. In other words, the solution was so weak that it produced effectively no bubbles. At eleven dollars a quart, I expected something much better.

Unique had a twenty percent blowout rate. This is getting into the realm of a very good solution.

Bubble Pro did very well with a ten percent blowout rate. The bubbles had good color and lasted up to forty seconds. At three dollars for a quart bottle, it was also the cheapest of the solutions.

Visual Effects Bubble Juice is the best I've ever used. The blowout rate was zero: the machine could run for minutes (representing over one hundred dips or tests) and never cause a single blowout. The bubbles are brightly colored and last up to a full minute. I've even seen bubbles dry in the air and hold their shape. These dry bubbles look like a network of spider webs supporting a thin, transparent shell. If these dried bubbles pop in the air, the gauzy remnant is so light that many times it will continue to float. I believe these effects are the result of the solution containing some corn syrup to prolong the bubble's life. This product is difficult to find. Contact the Visual Effects website at <http://web.archive.org/web/20021003185814/http://www.visualeffectsinc.com/> for a distributor near you. This solution cost twelve dollars for a quart. It's available from the xxx website.

#### **Homemade bubble formulas:**

Contrary to what I've read in many books and on several web sites, homemade bubble solutions are not as good as even the poorest manufactured solutions. Here are a few of the mixtures I've tested using distilled water:

1 part Ultra Joy dish soap, 15 parts water: popped immediately.

1 part Dawn, 15 parts water: popped immediately.

1 part Ultra Joy, 12 parts water: popped immediately.

1 part Ultra Joy, 15 parts water, .25 parts corn syrup: 3 bubbles per dip, lasted 20 seconds.

1 part Ultra Joy, 15 parts water, .25 parts glycerine: 2 bubbles per dip, lasted 20 seconds.

1 part Ultra Joy, 12 parts water, .25 parts corn syrup: 4 bubbles per dip, lasted 30 seconds.

1 part Ultra Joy, 12 parts water, .25 parts glycerine: 2 bubbles per dip, lasted 20 seconds.

1 part Ultra Joy, 12 parts water, 1 part corn syrup: 2 bubbles per dip, lasted 30 seconds.

1 part Ultra Joy, 8 parts water, .25 parts corn syrup: 5 bubbles per dip, lasted 30 seconds.

1 part Ultra Joy, 6 parts water, .25 parts corn syrup: 5 bubbles per dip, lasted 30 seconds.

As these tests indicate, the bubble production of a wide range of homemade solutions per dip is much less than even Mr. Bubbles and the bubble life isn't any longer. Corn syrup works better than glycerine but it has the drawback of leaving a small, gauzy residue that may attract insects.

I also tried adding two teaspoons of corn syrup to 3/4 of a cup of Imperial bubble solution. In my bubble blower it increased the number of bubbles produced per minute from 200 for Imperial by itself to 300, but this is still far below the 400 per minute rate achieved using Visual Effects Bubble Juice.

Many of the sources consulted for homemade mixtures suggested letting the solutions sit overnight before using. The reason given was that this allows certain aromatics to evaporate, making the solution more stable. While this may be true, my own observations suggest another reason why mixes left overnight work better than newly-made solutions. Glycerine, corn syrup and soap are viscous and resist mixing. I've observed long thin strands of them existing in water even after a full minute of stirring. Used in this state, the bubble solution isn't completely mixed, which means when a bubble is blown from it, there will be areas in the bubble wall where the solution is weaker and more prone to break. Letting the mixture sit overnight allows the various components to dissolve completely into each other. This makes the solution uniform and stronger.

#### **Optimized bubble solution:**

I tried mixing one tablespoon of corn syrup with a cup of the winning Visual Effects solution but the bubbles that resulted did not last significantly longer. Then I mixed a tablespoon of glycerine with a cup of Visual Effects and the sky opened up and smiled down on me! This solution is incredible. Some bubbles lasted up to five minutes in dry conditions. They soared a hundred feet into the air and floated around the neighborhood for what seemed like forever. From now on, this is the solution I'm going to be using.

#### **Bubble blowing machines:**

Bubble blowing machines range in price from \$30 to \$1500. They are classed by the number of bubbles per minute they produce. Little battery-powered units turn out 600 bubbles per minute. High-end machines can manufacture over 25,000 per minute.

Here are reviews for the two cheapest machines I could find:

Visual Effects sells a nice little bubble blower (model V-9903 Mini Bubbler), which operates off house current or two AA batteries. I've tried many bubble formulas in this machine and the company's mix works the best by far. Mine cost \$50. You can sometimes find these units in party-supply stores. I found that this machine runs a little slower using batteries. This unit can also be ordered on-line from:

<http://web.archive.org/web/20021003185814/http://www.mcphree.com/>

The second inexpensive bubble machine is the Bubble Pro Party Machine, which cost \$30. It's three times as big as the Mini-Bubbler, takes three times as much solution to work, produces three times the number of bubbles per minute, and runs slightly louder than the Mini-Bubbler. Bubble solution is held in a removable tray. That sounds like a good idea but the tray is so awkward to remove that I didn't find it much good. Removal is made easier by first sliding the rotating bubble wand off its axle. The one problem I had with this unit was that the air source covered more than one bubble wand at a time, which caused thirty percent of all the bubbles generated to be multiples with as many as ten bubbles stuck together. These multiple bubbles tended to fall to the ground very fast. The Bubble Pro also tended to froth up more than the Mini-Bubbler. A solution to both these problems is to cut out every other bubble-making ring. Of course this means the bubble production rate is cut in half. This machine can also be located in some party supply stores or ordered from <http://web.archive.org/web/20021003185814/http://www.backroomwarehouse.com/>

My preference is the Mini-Bubbler. The battery-powered option, ability to be used with a much smaller amount of bubble solution, low frothing, and it's resistance to producing multiple bubbles more than made up for the slower production rate of bubbles.

**DEFY GRAVITY!** As light as they seem, bubbles are still heavier than air and will fall to the ground and burst unless a breeze sustains them. This makes using a bubble machine on calm days or inside difficult. Fans placed under the machine and pointed upward don't seem to work, create rapid swirling motions that don't look right with bubbles, and cause many of them to break. Here is an easy solution. Buy a helium balloon kit (\$20 at most variety stores) and run a plastic tube from the tank's nozzle to the exhaust port for the fan on the bubble machine that inflates the soap bubbles. Turn the valve on low and adjust the flow until the bubbles float with neutral buoyancy. I found the flow rate needed to do this to be very low and a tank of helium can last for hours.

**Bubble supply sources:** A yellow pages search on the Internet found 80 party supply or party rental companies in the ten cities closest to me. Of these, only four carried bubble machines or professional grade bubble solution. The point here is that these devices

can be hard to find and that ordering over the Internet may be the best way to go. One rental place carried a mid-grade machine for \$34 a day (the same machine costs \$80 to purchase on the Internet.)

**A final word:** Bubbles are great but be warned that they are messy. Solution inevitably gets spilled, machines froth, and if the wind blows against you, you'll get slimed with bubble goo. Still, in the long run, as they climb high in the sky attracting smiles from anyone who sees them, there can be no doubt that they are worth it.

**Bubble links:**

The following sites will provide more detailed information on bubble physics, just take their recommended bubble solution formulas with a grain of salt.

Bubblesphere

Bubbles

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